

In the Claims

1-56 (canceled).

57 (new).      An isolated MCP protein comprising:

a)      amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins; or

b)      amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

58 (new).      The isolated MCP protein according to claim 57, wherein said MCP protein comprises amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

59 (new).      The isolated MCP protein according to claim 58, wherein said one or more amino acid positions are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine.

60 (new). The isolated MCP protein according to claim 57, wherein said MCP protein comprises amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine.

61 (new). The isolated MCP protein according to claim 57, in which one or more amino acid residues have been added, deleted, or substituted without interfering with the antagonistic activity of said protein.

62 (new). The isolated MCP protein according to claim 57, further comprising a heterologous amino acid sequence.

63 (new). The isolated MCP protein according to claim 57, wherein said MCP proteins have at least 70% homology with human mature MCP-1, MCP-2, MCP-3, MCP-4, or Eotaxin.

64 (new). The isolated MCP protein according to claim 57, wherein said MCP proteins are human MCP-1, human MCP-2, human MCP-3, human MCP-4, or human Eotaxin.

65 (new). The isolated MCP protein according to claim 57, comprising the sequence of SEQ ID NO: 3.

66 (new). The isolated MCP protein according to claim 57, further comprising a molecule chosen from radioactive labels, biotin, fluorescent labels, cytotoxic agents, or drug delivery proteins.

67 (new). The isolated MCP protein according to claim 62, wherein the heterologous amino acid sequence is selected from: extracellular domains of membrane-bound protein, immunoglobulin constant regions, multimerization domains, extracellular proteins, signal peptide-containing proteins or export signal-containing proteins.

68 (new). An isolated nucleic acid encoding a MCP protein comprising:

a) amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins; or

b) amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

69 (new). An expression vector comprising a nucleic acid encoding a MCP protein comprising:

a) amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins; or

b) amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

70 (new). A host cell transformed with an expression vector comprising a nucleic acid encoding a MCP protein comprising:

a) amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins; or

b) amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

71 (new). A process of preparing a MCP antagonist comprising culturing a host cell transformed with an expression vector comprising a nucleic acid encoding a MCP protein comprising:

a) amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins; or

b) amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

72 (new). A composition comprising a carrier and a MCP protein comprising:

a) amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins; or

b) amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

73 (new). The composition according to claim 72, wherein said MCP protein comprises amino acid substitutions at positions 18 and 19 and amino acid substitutions at one or more amino acid positions numbered 24, 44, 49, 58, 66 and 75, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

74 (new). The composition according to claim 73, wherein said MCP protein comprises amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine.

75 (new). The composition according to claim 73, wherein said MCP protein comprises amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine.

76 (new). The composition according to claim 72, wherein said MCP protein further comprises one or more amino acid residues that have been added, deleted, or substituted without interfering with the antagonistic activity of said MCP protein.

77 (new). The composition according to claim 72, wherein said MCP protein further comprises a heterologous amino acid sequence.

78 (new). The composition according to claim 72, wherein said MCP protein has at least 70% homology with human mature MCP-1, MCP-2, MCP-3, MCP-4, or Eotaxin.

79 (new). The composition according to claim 72, wherein said MCP proteins are human MCP-1, human MCP-2, human MCP-3, human MCP-4, or human Eotaxin.

80 (new). The composition according to claim 72, wherein said MCP protein comprises SEQ ID NO: 3.

81 (new). The composition according to claim 72, wherein said MCP protein further comprises a molecule chosen from radioactive labels, biotin, fluorescent labels, cytotoxic agents, or drug delivery proteins.

82 (new). The composition according to claim 77, wherein the heterologous amino acid sequence is selected from: extracellular domains of membrane-bound protein, immunoglobulin constant regions, multimerization domains, extracellular proteins, signal peptide-containing proteins or export signal-containing proteins.

83 (new). The composition according to claim 72, wherein said MCP protein has amino acids at positions 18 and 19 substituted with alanine.

84 (new). A method of reducing leukocyte migration and activation comprising contacting leukocytes with a composition comprising a carrier and a MCP protein comprising amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins.

85 (new). A method of treating a disease or disorder comprising the administration of an effective amount of a composition comprising a carrier and a MCP protein comprising amino acid substitutions at positions 18 and 19, as numbered on the sequence of human mature MCP-1, wherein amino acids at positions 18 and 19 are substituted with alanine, glycine, serine, threonine, proline, aspartic acid, asparagine, glutamic acid or glutamine and wherein said MCP protein has antagonistic activity to unaltered MCP proteins to an individual in need of treatment for a disease or disorder.

86 (new). The method according to claim 84, wherein the disease or disorder is selected from the group consisting of vascular disorders, cancer, inflammatory diseases, autoimmune diseases and infection.